Space Weather Forecast

Issued on Sunday, 22 May 2022 at 01:03 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: R1-R2 Radio Blackouts likely from Moderate-class X-ray flares.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity was Low over the past 24 hours, the background flux remaining in the C-class range with only minor isolated flares.

There are currently up to eight sunspot regions on the disc, seven of which are numbered. By far the largest and most complex remains the group of spots located in the centre northwest quadrant. This feature is likely to be mature, with only slow changes observed in the form of minor trailing spot development and a slight increase in its area in the 24 hours. Also of note was a new sunspot region that appeared in the southeastern limb, as well as the region currently in the central northern hemisphere, which continued to show the development of numerous small spots. All other groups showed eventual decaying trends, with no significant flares. No Earth-directed Coronal Mass Ejections (CME) were observed in available imagery in the last 24 hours.

Solar Wind / Geomagnetic Activity: Solar wind speeds, as measured by ACE and DSCOVR at L1, slowly decreased from 550 to 460 km/s during the last 24 hours, under the waning influence of coronal hole 82. The number of particles in the solar wind and their associated magnetic field were both weak, with limited though occasionally prolonged negative deviations in the important north-south component. The net result of the above solar wind measures was provisionally Quiet to Unsettled.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is Likely to be moderate, with a continuing chance of flares (R1-R2 Radio Blackout). The main source of the activity is likely to be from the largest spot, which remains present throughout the coming four-days on the Earth-facing side. A large CME has been observed leaving the far side of the sun earlier, indicating the presence of one or more active regions. This is also confirmed by bright flux regions visible on satellite imagery. These will need to be closely monitored over the next few days, as they gradually emerge on to the eastern limb.

Solar Wind / Geomagnetic Activity: No Earth-directed CMEs are currently expected. Solar winds are now under the waning influence of coronal hole 82 and expected to come back to ambient levels over the following days. They might become slightly enhanced on day 3 (24th) but any impact on the geomagnetic conditions should remain minor and brief. Geomagnetic activity is expected to be mostly Quiet with a few Unsettled periods.

Energetic Particles / Solar Radiation: No solar radiation storms are expected, with a daily

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slight chance of reaching S1, should any notable X-ray flares occur.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	1	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	50	50	50	50
Very Active	R3 to R5 X	No	10	10	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	10	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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